AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claims 1-52 (Canceled).

53. (Currently Amended) A computer system for determining a level of protein activity comprising a processor and a memory coupled to said processor, said memory encoding one or more programs, said one or more programs causing said processor to perform a method comprising determining a level of perturbation to said protein at which similarity is greatest between a diagnostic profile and [[a]] an interpolated perturbation response profile ~~extracted from perturbation response curves for said determined level of perturbation to said protein~~, said diagnostic profile ~~having been obtained by a method~~ comprising ~~measuring~~ measurements of a first plurality of cellular constituents in a cell of said cell type, said interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurements as a function of level of said perturbation to said protein, and said perturbation response curves being the products of a method comprising:

(i) providing perturbation response profiles of said protein for said cell type, wherein each said perturbation response ~~profiles are obtained by measuring a~~ profile comprises measurements of a second plurality of cellular constituents in a cell of said cell type at one of a plurality of discrete levels of perturbation to said protein, and

(ii) interpolating measurements of each cellular constituent of said second plurality in said perturbation response profiles over said plurality of discrete levels of said perturbation to obtain a perturbation response curve of said cellular constituent so that [[a]] an interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents may be extracted at a level over a range of levels of perturbation to said protein, [[wherein said interpolated response profiles comprise said perturbation response curves,]]

2

wherein said determined level of perturbation to said protein represents said protein activity level in said cell type.

54. (Currently Amended) The computer system of claim 53 wherein determining the level of perturbation is achieved by a method comprising:

(a)   determining the value of a function of the difference between said diagnostic profile and [[the]] an interpolated perturbation response profile extracted from said perturbation response curves for a level of perturbation to said protein; and

(b)   minimizing said determined value of said function by varying the level of perturbation to said protein to determine a level of perturbation that minimizes said determined value of said function.

55. (Currently Amended) The computer system of claim 53 wherein said diagnostic [[profiles]] profile and said perturbation response [[curves]] profiles are made available in said memory.

56. (Previously Presented) The computer system of claim 55 wherein said programs cause said processor to perform said step of interpolating said perturbation response profiles.

57. (Currently Amended) The computer system of claim 54 wherein said function comprises a sum of the squares of differences of measurements in the diagnostic profile and measurements in the interpolated perturbation response profile extracted from said perturbation response curves.

58. (Currently Amended) The computer system of claim 53 wherein determining the level of perturbation is achieved by a method comprising:

(a)   determining the value of a function of the correlation between said diagnostic profile and [[the]] an interpolated perturbation response profile extracted from said perturbation response curves for a level of perturbation to said protein; and

(b)   maximizing said determined value of said function by varying the level of perturbation to said protein to determine a level of perturbation that maximizes said determined value of said function.

3

59. (Previously Presented) The computer system of claim 54 wherein said minimizing comprises performing the Levenberg-Marquandt method.

Claims 60-66 (Canceled).

67. (Currently Amended) A computer system for determining levels of [[protein activity]] activities of a plurality of proteins comprising a processor and a memory coupled to said processor, said memory encoding one or more programs, said one or more programs causing said processor to perform a method comprising determining a level of perturbation to each said protein at which similarity is greatest between a diagnostic profile and a combination of interpolated perturbation response profiles extracted from perturbation response curves for each said protein for each said determined level of perturbation, said diagnostic profile having been obtained by a method comprising measuring measurements of a first plurality of cellular constituents in a cell of said cell type, each said interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurements as a function of level of said perturbation to said protein, wherein said perturbation response curves for each of said proteins are the products of a method comprising

> (i) providing perturbation response profiles of said protein for said cell type, wherein each said perturbation response profiles are obtained by measuring a profile comprises measurements of a second plurality of cellular constituents in a cell of said cell type at one of a plurality of discrete levels of perturbation to said protein, and

> (ii) interpolating measurements of each cellular constituent of said second plurality in said perturbation response profiles over said plurality of discrete levels of said perturbation levels to obtain a perturbation response curve of said cellular constituent so that [[a]] an interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents may be extracted at a level over a range of levels of perturbation to said protein, wherein said interpolated response profiles comprise said perturbation response curves

wherein said determined level of perturbation to each said protein represents said activity level of each said protein in said cell type.

4

68. (Currently Amended) The computer system of claim 67 wherein said determining the level of perturbation is achieved by a method comprising:

(a)   determining the value of a function of the difference between said diagnostic profile and the combination of [[the]] interpolated perturbation response profiles extracted from said perturbation response curves for said level of perturbation to each said protein; and

(b)   minimizing said determined value of said function by varying the level of perturbation to each said protein to determine the level of perturbation to each said protein that minimizes said determined value of said function.

Claims 69-70 (Canceled).

71. (Currently Amended) A computer system for determining a level of activity of a biologically active cellular constituent of interest comprising a processor and a memory coupled to said processor, said memory encoding one or more programs, said one or more programs causing said processor to perform a method comprising determining a level of perturbation to the cellular constituent of interest at which similarity is greatest between a diagnostic profile and [[a]] an interpolated perturbation response profile extracted from perturbation response curves for said determined level of perturbation to the cellular constituent of interest, said diagnostic profile having been obtained by a method comprising measuring measurements of a first plurality of cellular constituents in a cell of said cell type, said interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurements as a function of level of said perturbation to said cellular constituent of interest, and said perturbation response curves being the products of a method comprising:

(i)   providing perturbation response profiles of the cellular constituent of interest for said cell type, wherein each said perturbation response profiles are obtained by measuring a profile comprises measurements of a second plurality of cellular constituents in a cell of said cell type at one of a plurality of discrete levels of perturbation to the cellular constituent of interest, and

5

(ii)   interpolating <u>measurements of each cellular constituent of said second plurality in</u> said perturbation response profiles <u>over said plurality of discrete levels of said perturbation to obtain a perturbation response curve of said cellular constituent</u> so that [[a]] <u>an interpolated</u> perturbation response profile <u>comprising measurements of said first plurality of cellular constituents</u> may be extracted <u>at a level</u> over a range of levels of perturbation to the cellular constituent of interest, [[wherein said interpolated response profiles comprise said perturbation response curves,]]

wherein said determined level of perturbation to the cellular constituent of interest represents the activity level of said cellular constituent of interest in said cell type.

72. (Currently Amended) The computer system of claim 71, wherein determining the level of perturbation is achieved by a method comprising:

(a)   determining the value of a function of the difference between said diagnostic profile and ~~the~~ <u>an interpolated</u> perturbation response profile extracted from said perturbation response curves for a level of perturbation to said cellular constituent of interest; and

(b)   minimizing said determined value of said function by varying the level of perturbation to said cellular constituent of interest to determine a level of perturbation that minimizes said determined value of said function.

Claims 73-78 (Canceled).

79. (Currently Amended) A computer program product for use in conjunction with a computer having a processor and a memory connected to the processor, said computer program product comprising a computer readable storage medium having a computer program mechanism encoded thereon, wherein said computer program mechanism may be loaded into the memory of said computer and cause said computer to carry out a method comprising determining a level of perturbation to a protein at which similarity is greatest between a diagnostic profile and [[a]] <u>an interpolated</u> perturbation response profile ~~extracted from perturbation response curves for said determined level of perturbation to a protein~~, said diagnostic profile ~~having been obtained by a method~~ comprising ~~measuring~~ <u>measurements of</u>

a first plurality of cellular constituents in a cell of said cell type, <u>said interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurement as a function of level of said perturbation to said protein, and</u> said perturbation response curves being the products of a method comprising:

(i) providing perturbation response profiles of said protein for said cell type, wherein <u>each</u> said perturbation response <s>profiles are obtained by measuring a</s> <u>profile comprises measurements of a</u> second plurality of cellular constituents in a cell of said cell type at <u>one of</u> a plurality of discrete levels of perturbation to said protein, and

(ii) interpolating <u>measurements of each cellular constituent of said second plurality in</u> said perturbation response profiles <u>over said plurality of discrete levels of said perturbation to obtain a perturbation response curve of said cellular constituent</u> so that [[a]] <u>an interpolated</u> perturbation response profile <u>comprising measurements of said first plurality of cellular constituents</u> may be extracted <u>at a level</u> over a range of levels of perturbation to said protein, [[wherein said interpolated response profiles comprise said perturbation response curves,]]

wherein said determined level of perturbation to said protein represents a level of activity of said protein in said cell type.

80. (Currently Amended) A computer program product for use in conjunction with a computer having a processor and a memory connected to the processor, said computer program product comprising a computer readable storage medium having a computer program mechanism encoded thereon, wherein said computer program mechanism may be loaded into the memory of said computer and cause said computer to carry out a method comprising determining an activity level of a protein in a cell treated with a drug according to a method comprising determining a level of perturbation to said protein at which similarity is greatest between a diagnostic profile and [[a]] <u>an interpolated</u> perturbation response profile <s>extracted from perturbation response curves for the determined level of perturbation to said protein</s>, wherein:

(a)   the diagnostic profile ~~is obtained by a method comprising~~ ~~measuring~~ comprises measurements of a first plurality of cellular constituents in the cell treated with said drug; and

(b)   the interpolated perturbation response profile comprises measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurements as a function of level of said perturbation to said protein, the perturbation response curves are provided by a method comprising

         (i) providing perturbation response profiles of said protein for said cell type, wherein each said perturbation response ~~profiles are obtained by~~ ~~measuring a~~ profile comprises measurements of a second plurality of cellular constituents in a cell of said cell type at one of a plurality of discrete levels of perturbation to said protein, and

         (ii) interpolating measurements of each cellular constituent of said second plurality in said perturbation response profiles over said plurality of discrete levels of said perturbation levels to obtain a perturbation response curve of said cellular constituent so that [[a]] an interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents may be extracted at a level over a range of levels of perturbation to said protein, [[wherein said interpolated response profiles comprise said perturbation response curves,]]

and wherein said determined level of perturbation to said protein represents said protein activity level in said cell treated with said drug and said protein activity level is a measure of activity of said drug.

81. (Currently Amended) A computer program product for use in conjunction with a computer having a processor and a memory connected to the processor, said computer program product comprising a computer readable storage medium having a computer program mechanism encoded thereon, wherein said computer program mechanism may be loaded into the memory of said computer and cause said computer to carry out a method

comprising determining a level of perturbation to a biologically active cellular constituent of interest at which similarity is greatest between a diagnostic profile and [[a]] an interpolated perturbation response profile ~~extracted from perturbation response curves for said determined level of perturbation to the cellular constituent of interest~~, said diagnostic profile ~~having been obtained by a method~~ comprising ~~measuring~~ measurements of a first plurality of cellular constituents in a cell of said cell type, said interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents extracted for said determined level from perturbation response curves of said measurements as a function of level of said perturbation to said cellular constituent of interest, and said perturbation response curves being the products of a method comprising

(i)   providing perturbation response profiles of the cellular constituent of interest for said cell type, wherein each said perturbation response ~~profiles are obtained by measuring a~~ profile comprises measurements of a second plurality of cellular constituents in a cell of said cell type at one of a plurality of discrete levels of perturbation to the cellular constituent of interest, and

(ii)   interpolating measurements of each cellular constituent of said second plurality in said perturbation response profiles over said plurality of discrete levels of said perturbation to obtain a perturbation response curve of said cellular constituent so that [[a]] an interpolated perturbation response profile comprising measurements of said first plurality of cellular constituents may be extracted at a level over a range of levels of perturbation to the cellular constituent of interest, [[wherein said interpolated response profiles comprise said perturbation response curves,]]

wherein said determined level of perturbation to the cellular constituent of interest represents a level of activity of said cellular constituent of interest in said cell type.

Claims 82-84 (Canceled).